What we claimed is:

1. A coated cemented carbide which comprises a cemented carbide base metal comprising a hard phase containing tungsten carbide and a binder phase, and a hard film being provided on a surface of the base metal with a single layer or two or more laminated layers, wherein at least part of the surface of the base metal is subjected to machining processing, and substantially no crack is present in particles of said hard phase existing at an interface of the surface of the base metal subjected to machining processing and the hard film.

2. The coated cemented carbide according to Claim 1, wherein peak intensities of crystal surfaces satisfy

$$hs(001)_{WC}/hs(101)_{WC} \geq 1.1 \times hi(001)_{WC}/hi(101)_{WC}$$

wherein $hs(001)_{WC}$ and $hs(101)_{WC}$ each represent a peak intensity of (001) crystal face and that of (101) crystal face at the surface of the base metal subjected to machining processing, respectively, and $hi(001)_{WC}$ and $hi(101)_{WC}$ each represent a peak intensity of (001) crystal face and that of (101) crystal face in the base metal, respectively.

3. The coated cemented carbide according to Claim 1, wherein at least part of the surface of said base metal comprises a burnt surface, and the surface satisfies the formula: $ds \leq di$ wherein ds represents an average particle size of the particles at the burnt surface and di represents an average particle size of the particles at inside of the alloy.

4. The coated cemented carbide according to Claim 1, wherein the hard phase at an interface of the surface of the base metal subjected to machining and the hard film has a particle size substantially exceeding 0.2 μm.

5. The coated cemented carbide according to Claim 1, wherein the hard film comprises a single layer or a laminated layers of two or more comprising at least one material selected from the group consisting of a carbide, a nitride or an oxide of an element of Group 4, 5 or 6 of the Periodic Table, aluminum or silicon, and a solid solution of the above-mentioned compounds.

6. The coated cemented carbide according to Claim 1, wherein an interface between the hard film and the base metal comprises a nitride, a carbide or a carbonitride of titanium and a solid solution of tungsten carbide and at least one of the above-mentioned compounds.

7. The coated cemented carbide according to Claim 1, wherein the hard film directly above the hard phase existing in the base metal at an interface of the base metal and the hard film contains a diffusion element which contains an iron-group metal element and tungsten element.

8. The coated cemented carbide according to Claim 7, wherein an iron-group metal layer with an average thickness of 0.5 μm or less is formed at an interface between the hard phase and the hard film directly above the hard phase.

9. The coated cemented carbide according to Claim 5, wherein the hard film directly above the hard phase existing in the base metal at an interface of the base metal and the hard film contains a diffusion element which contains an iron-group metal element and tungsten element.

10. The coated cemented carbide according to Claim 9, wherein an iron-group metal layer with an average thickness of 0.5 μm or less is formed at an interface between the hard phase and the hard film directly above the hard phase.

11. The coated cemented carbide according to Claim 6, wherein

the hard film directly above the hard phase existing in the base metal at an interface of the base metal and the hard film contains a diffusion element which contains an iron-group metal element and tungsten element.

12. The coated cemented carbide according to Claim 11, wherein an iron-group metal layer with an average thickness of 0.5 μm or less is formed at an interface between the hard phase and the hard film directly above the hard phase.

13. A coated cemented carbide which comprises a cemented carbide base metal comprising a hard phase containing tungsten carbide and a binder phase, and a hard film being provided on a surface of the base metal with a single layer or two or more laminated layers, wherein at least part of the surface of the base metal is subjected to machining processing, and peak intensities of crystal surfaces satisfy

$$hs(001)_{WC}/hs(101)_{WC} \geq 1.1 \times hi(001)_{WC}/hi(101)_{WC}$$

wherein $hs(001)_{WC}$ and $hs(101)_{WC}$ each represent a peak intensity of (001) crystal face and that of (101) crystal face at the surface of the base metal subjected to machining processing, respectively, and $hi(001)_{WC}$ and $hi(101)_{WC}$ each represent a peak intensity of (001) crystal face and that of (101) crystal face in the base metal, respectively.

14. The coated cemented carbide according to Claim 13, wherein at least part of the surface of said base metal comprises a burnt surface, and the surface satisfies the formula: $ds \leq di$

wherein ds represents an average particle size of the particles at the burnt surface and di represents an average particle size of the particles at inside of the alloy.

15. The coated cemented carbide according to Claim 13, wherein the hard phase at an interface of the surface of the base metal

subjected to machining and the hard film has a particle size substantially exceeding 0.2 μm.

16. The coated cemented carbide according to Claim 13, wherein the hard film comprises a single layer or a laminated layers of two or more comprising at least one material selected from the group consisting of a carbide, a nitride or an oxide of an element of Group 4, 5 or 6 of the Periodic Table, aluminum or silicon, and a solid solution of the above-mentioned compounds.

17. The coated cemented carbide according to Claim 13, wherein an interface between the hard film and the base metal comprises a nitride, a carbide or a carbonitride of titanium and a solid solution of tungsten carbide and at least one of the above-mentioned compounds.

18. The coated cemented carbide according to Claim 16, wherein the hard film directly above the hard phase existing in the base metal at an interface of the base metal and the hard film contains a diffusion element which contains an iron-group metal element and tungsten element.

19. The coated cemented carbide according to Claim 18, wherein an iron-group metal layer with an average thickness of 0.5 μm or less is formed at an interface between the hard phase and the hard film directly above the hard phase.

20. The coated cemented carbide according to Claim 17, wherein the hard film directly above the hard phase existing in the base metal at an interface of the base metal and the hard film contains a diffusion element which contains an iron-group metal element and tungsten element.

21. The coated cemented carbide according to Claim 20, wherein an iron-group metal layer with an average thickness of 0.5 μm or less is formed at an interface between the hard phase and

the hard film directly above the hard phase.

22. A process for producing the coated cemented carbide which comprises at least the steps of

(A) subjecting to at least surface-pretreatments of

(1) machining processing of at least part of a surface of a cemented carbide substrate comprising a hard phase containing tungsten carbide, and a binder phase, and

(2)(a) effecting an electro-chemical polishing treatment on the surface of the substrate or (2)(b) effecting the electro-chemical polishing treatment and a coating treatment onto at least part of the surface of the substrate with at least one of an iron-group metal element and a compound thereof to form a uniform film, and then,

(B) providing at least one hard film on the surface of the resulting substrate.

23. The process according to Claim 22, wherein the machining processing is at least one selected from the group consisting of a whetstone grinding, brush grinding, lap processing, blast processing and ultrasonic wave processing.

24. The process according to Claim 22, wherein the electropolishing processing in the pretreatment is carried out by using an electrolytic solution containing, as an essential component, at least one compound selected from the group consisting of a hydroxide, a nitrite, a sulfite, a phosphite or a carbide of a metal of Group 1 of the Periodic Table.

25. The process according to Claim 24, wherein the electrolytic solution comprises, as an essential component, at least one compound selected from the group consisting of a nitrite of sodium and/or potassium, a hydroxide and a ferricyanide of the same, and a hydroxide and a chloride of the same.

26. The process according to Claim 22, wherein the coating

treatment in the pretreatment is at least one chemical coating method selected from the group consisting of electroplating, electroless plating, vacuum deposition, physical vapor deposition (PVD), chemical vapor deposition (CVD), colloid coating and solution coating; or at least one mechanical coating method selected from the group consisting of blast processing using a shot material mainly comprising an iron-group metal or a mixture of the shot material and at least one of a grinding material and a polishing material, and a shot processing.

27. The process according to Claim 26, wherein the coating treatment in the pretreatment is an electroplating using a solution containing an iron-group metal as main component or a waste solution of the electrolytic solution in the electropolishing treatment.